

REMARKS

I. Introduction

Claims 14 to 16, 19, 20 and 26 to 35 are currently pending in the present application. In view of the foregoing amendments and the following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

II. Rejection of Claims 14 to 16, 19, 20, 26 to 28 and 32 to 35 Under 35 U.S.C. § 103(a)

Claims 14 to 16, 19, 20, 26 to 28 and 32 to 35 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of U.S. Patent No. 5,850,735 ("Araki et al.") and U.S. Patent No. 5,114,691 ("Pinnavaia et al."). Applicants respectfully submit that the combination of Araki et al. and Pinnavaia et al. does not render unpatentable the present claims as amended herein for the following reasons.

Claim 14 relates to an emission control system including a particle filter and an arrangement disposed upstream from the particle filter configured to at least reduce clogging of the particle filter by prevention of development of at least one of zinc-, alkaline- and earth alkaline-containing sulfate ash upstream from the particle filter by one of transformation and maintenance of at least one of the compounds responsible for sulfate ash formation in the gaseous state. Claim 14 recites that the arrangement includes a device configured to collect at least a portion of the sulfate ash-forming compounds contained in the exhaust gas and a device configured to convert the collected sulfate ash-forming compounds into gaseous compounds of sulfur that do not form sulfate ash.

Claim 32 relates to a method for operating an emission control system including a particle filter and an arrangement disposed upstream from the filter and configured to at least reduce clogging of the particle filter by prevention of development of at least one of zinc-, alkaline- and earth alkaline-containing sulfate ash upstream from the particle filter. Claim 32 recites the step of maintaining at least a portion of the compounds responsible for the sulfate ash formation in a gaseous state. Claim 32 further recites collecting at least a portion of the sulfate ash-forming compounds contained in the exhaust gas and converting the collected

sulfate ash-forming compounds into gaseous compounds of sulfur that do not form sulfate ash.

Claim 35 relates to an emission control system including a particle filter and an arrangement disposed upstream from the particle filter. Claim 35 recites that the arrangement is configured to at least reduce clogging of the particle filter by prevention of development of at least one of zinc-, alkaline- and earth alkaline-containing sulfate ash upstream from the particle filter by transforming or maintaining at least one of the compounds being responsible for the sulfate ash formation in the gaseous state. Claim 35 further recites that the arrangement includes means for collecting at least a portion of the sulfate ash-forming compounds contained in the exhaust gas and means for converting the collected sulfate ash-forming compounds into gaseous compounds of sulfur that do not form sulfate ash.

Claims 14, 32 and 35 have been amended herein without prejudice to recite that the arrangement is separate and spaced apart from the particle filter and configured to at least reduce clogging of the particle filter by prevention of development of at least one of zinc-, alkaline- and earth alkaline-containing sulfate ash upstream from the particle filter between the particle filter and the arrangement by one of transformation and maintenance of at least one of the compounds responsible for sulfate ash formation in the gaseous state. No new matter has been added. See Figures 1 to 3 and the Specification, for example, at p. 5, lines 1 to 23.

Nowhere does the combination of Araki et al. and Pinnavaia et al. disclose, or even suggest, an arrangement **separate and spaced apart from** the particle filter and configured to at least reduce clogging of the particle filter by prevention of development of at least one of zinc-, alkaline- and earth alkaline-containing sulfate ash upstream from the particle filter **between the particle filter and the arrangement** by one of transformation and maintenance of at least one of the compounds responsible for sulfate ash formation in the gaseous state, as recited in amended claims 14, 32 and 35. The DPF 93 of Araki et al. is stated to have porous walls, which collect the soot, and numerous internal gas passages **coated** with alumina, silica or titania, which absorb sulfate. See col. 15, lines 52 to 59. Therefore, the sulfate absorbent cannot be said to be **separate and spaced apart** from the particle filter. Nor can the sulfate absorbent coating be stated to be configured to prevent the development of at least one of at least one of zinc-,

alkaline- and earth alkaline-containing sulfate ash upstream from the particle filter **between the particle filter and the arrangement**, given that there is no space between the particle filter and the arrangement. In Araki et al., a sulfate ash-forming compound (SOx) is collected within the filter, whereas in the subject matter as claimed in claims 14, 32 and 35, sulfate ash-forming compounds are collected upstream of the filter **before they can reach the filter**, whereby clogging of the filter is reduced. See, for example, p. 5, lines 10 to 15 of the Specification. Use of a sulfate absorbent coating necessarily leads to accumulation of sulfur oxides, e.g., SO₂ and SO₃, **directly on the filter**, which may clog the filter. Use of a separate upstream sulfate absorbent, including, for example, a separate barium storage metal, results in accumulation of the sulfur oxides (in the form of BaSO₄) on the storage metal and avoids the accumulation of potentially clogging elements on the filter itself. See p. 5, lines 10 to 13 of the Specification. Therefore, the combination of Araki et al. and Pinnavaia et al. does not disclose all of the limitations of claims 14, 32 and 35.

In rejecting a claim under 35 U.S.C. § 103(a), the Examiner bears the initial burden of presenting a prima facie case of obviousness. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). To establish prima facie obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must be found in the prior art and not based on the application disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art reference(s) must teach or suggest all of the claim limitations. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974). As stated above, the combination of Araki et al. and Pinnavaia et al. does not disclose, or even suggest, an arrangement **separate and spaced apart** from the particle filter and configured to at least reduce clogging of the particle filter by prevention of development of at least one of zinc-, alkaline- and earth alkaline-containing sulfate ash upstream from the particle filter **between the particle filter and the arrangement** by one of transformation and maintenance of at least one of the compounds responsible for sulfate ash formation in the gaseous state, as recited in amended claims 14, 32 and

35. It is therefore respectfully submitted that the combination of Araki et al. and Pinnavaia et al. does not render obvious claims 14, 32 and 35.

In response to Applicants' arguments that Araki et al. and Pinnavaia et al. teach away from the pending application because they actually lead to clogging of the filter, the Final Office Action refers to col. 17, lines 8 to 27 of Araki et al., which discusses Araki et al.'s regeneration of the sulfate absorbent. However, regeneration is only performed when, for example, the amount of SO_x absorbed by the absorbent reaches a predetermined value. See col. 15, line 66 to col. 16, line 2. In contrast, claims 14, 32 and 35 each recite that arrangement is configured to transform and maintain at least one of the compounds responsible for ash formation in the gaseous state. Respectfully, regeneration of the sulfate absorbent is not continuous and therefore does not maintain at least one of the compounds responsible for ash formation in the gaseous state, as recited in claims 14, 32 and 35.

In view of the foregoing, it is respectfully submitted that there is no evidence that the references relied upon, whether taken alone, combined or modified, would provide the features and benefits of claims 14, 32 and 35. It is therefore respectfully submitted that claims 14, 32 and 35 are allowable for these reasons.

As for claims 15, 16, 19, 20 and 26 to 28, which ultimately depend from claim 14 and therefore include all of the limitations of claim 14, it is respectfully submitted that the combination of Araki et al. and Pinnavaia et al. does not render obvious these dependent claims for at least the same reasons given above in support of the patentability of claim 14. *In re Fine, supra* (any dependent claim that depends from a non-obvious independent claim is non-obvious).

As for claims 33 and 34, which ultimately depend from claim 32 and therefore include all of the limitations of claim 32, it is respectfully submitted that the combination of Araki et al. and Pinnavaia et al. does not render obvious these dependent claims for at least the same reasons given above in support of the patentability of claim 32. *Id.*

In view of all of the foregoing, withdrawal of this rejection is therefore respectfully requested.

III. Rejection of Claims 29 to 31 Under 35 U.S.C. §103(a)

Claims 29 to 31 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Araki et al., Pinnavaia et al. and U.S. Patent No. 6,233,927 ("Hirota et al."). Applicants respectfully submit that the combination of Araki et al., Pinnavaia et al. and Hirota et al. does not render unpatentable the present claims for the following reasons.

Hirota et al. purport to describe an exhaust gas purification device including a trapping element arranged in the exhaust passage upstream of the NOx absorbent for trapping particulates and a processing element for processing the particulates trapped in the trapping element to regenerate the trapping element. Abstract.

Claims 29 to 31 ultimately depend from claim 14 and therefore include all of the limitations of claim 14. Therefore, Applicants respectfully submit that the combination of Araki et al., Pinnavaia et al. and Hirota et al. does not render obvious claims 29 to 31 for at least the reasons submitted above with respect to claim 14. Specifically, Applicants respectfully submit that the combination of Araki et al., Pinnavaia et al. and Hirota et al. does not disclose, or even suggest, an arrangement **separate and spaced apart from** the particle filter and configured to at least reduce clogging of the particle filter by prevention of development of at least one of zinc-, alkaline- and earth alkaline-containing sulfate ash **upstream** from the particle filter **between the particle filter and the arrangement** by one of transformation and maintenance of at least one of the compounds responsible for sulfate ash formation in the gaseous state, as recited in amended claim 14.

Therefore, it is respectfully submitted that the combination of Araki et al., Pinnavaia et al. and Hirota et al. does not render obvious claims 29 to 31. Accordingly, withdrawal of this rejection is respectfully requested.

IV. Conclusion


It is therefore respectfully submitted that the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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